DETAILED ACTION

Status of objections and rejections

1. Applicant's responses filed in the papers of 7/22/2008 and 01/27/2009 are entered.

2. Claims 22, 25, 28-33 and 52-53 are pending.

3. Claims 1-21, 23-24, 26-27 and 34-51 are cancelled.

4. Claims 52-53 added in the amendment of 7/22/2008 fall within the scope of the elected invention, and are thus included in the present examination.

5. Claims 22, 25, 28-33 and 52-53 are examined on merits in the present Office action.

6. Objections to the specification are withdrawn in light of amendments to the specification and drawings filed in the papers of 7/22/2008 and 01/27/2009.

7. Objection to claim 22 is withdrawn in light of amendment to claim 22 filed in the paper of 7/22/2008. Objections to claim 23 are withdrawn in light of cancellation of claim 23 filed in the paper of 7/22/2008.

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. Rejections of claims 28-29 under 35 U.S.C. 112, 2nd paragraph are withdrawn in light of claim amendments filed in the paper of 7/22/2008.

10. Rejections of claims 22, 25, 28-31 and 33 under 35 U.S.C. 112, 1st paragraph are withdrawn in light of claim amendments filed in the paper of 7/22/2008. Rejections of claims 23-24, 26 and 27 under 35 U.S.C. 112, 1st paragraph are withdrawn in light of cancellation of claims 23-24, 26 and 27 filed in the paper of 7/22/2008.

11. Rejection of claims 22, 25 and 30-33 under 35 U.S.C. 102(b) as being anticipated by Fukuda et al. (European Patent Publication No. EP 1143002 A1, Published October 10,

2001; Applicant's IDS) is withdrawn in light of claim amendment filed in the paper of 7/22/2008. Rejection of claims 23-24 under 35 U.S.C. 102(b) as being anticipated by Fukuda et al. (European Patent Publication No. EP 1143002 A1, Published October 10, 2001; Applicant's IDS) is withdrawn in light of cancellation of claims 23 and 24 filed in the paper of 7/22/2008.

12. Rejection of claims 22, 25 and 30-33 under 35 U.S.C. 102(e) as being anticipated by Fukuda et al. (US Patent No. 6,861,574 B2, Issued March 1, 2005, filed June 22, 2001) is withdrawn in light of claim amendment filed in the paper of 7/22/2008. Rejection of claims 23-24 under 35 U.S.C. 102(e) as being anticipated by Fukuda et al. (US Patent No. 6,861,574 B2, Issued March 1, 2005, filed June 22, 2001) is withdrawn in light of cancellation of claims 23 and 24 filed in the paper of 7/22/2008.

13. Rejection of claims 26-27 under 35 U.S.C. 103(a) as being unpatentable over Fukuda et al. (European Patent Publication No. EP 1143002, A1, Published October 10, 2001, Applicant's IDS), and further in view of Wu et al. (Plant cell Physiol. 39:885-889, 1998) is withdrawn in light of cancellation of claims 26 and 27 filed in the paper of 7/22/2008.

Election/Restriction

14. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Objections

15. Claims 29-32 and 53 are objected to because of the following informalities:

Claim 29 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim, or amend the claim to place the claim in proper dependent form, or rewrite the claim in independent form. Parent claim 22 is limited to using a seed-specific promoter or a tissue-specific promoter. Dependent claim 29 fails to limit the parent claim because it encompasses a weak constitutive promoter. Thus claim 29 fails to further limit the subject matter of previous claim. Furthermore, claim 29 fails the infringement test because claim 29 would conceivably be infringed by a weak constitutive promoter which would not infringe claim 22. See MPEP § 608.01(n).

Claim 53 is also objected because it is dependent on claim 29.

Claims 30 and 31 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Parent claim 22 is directed to SEQ ID NO: 1 encoding SEQ ID NO: 2. It is important to note that there is only one SEQ ID NO: 1 which is isolated from rice (*Oryza*) and which belongs to family Poaceae. Thus, claims 30 and 31 fail to limit the scope of parent claim 22.

Claim 32 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim, or amend the claim to place the claim in proper dependent form, or rewrite

the claim in independent form. Parent claim 22 is directed to SEQ ID NO: 1 encoding SEQ ID NO: 2. Dependent claim 32 fails to limit the parent claim because it encompasses a nucleotide sequence that may not comprise the nucleotide sequence of SEQ ID NO: 1 but is capable of hybridizing to SEQ ID NO: 1 under stringent conditions. The stringent conditions would encompass hybridization of nucleotide sequences other than SEQ ID NO: 1. Furthermore, claim 32 fails the infringement test because claim 32 would conceivably be infringed by a nucleotide sequence which does not comprise the nucleotide sequence of SEQ ID NO: 1 but is capable of hybridizing under "stringent conditions" to SEQ ID NO: 1, whereas, the nucleotide sequence (other than SEQ ID NO: 1) that hybridizes under stringent conditions to SEQ ID NO: 1 would not infringe claim 22. It is important to note that "stringent conditions" recited in claim 32 would encompass low stringency conditions of hybridization (see 112, 2nd paragraph rejection below) that would allow unrelated sequences to hybridize to SEQ ID NO: 1. See MPEP § 608.01(n).

These objections have been necessitated due to the amendment in claim 22 filed in the paper of 7/22/2008.

Appropriate corrections are requested.

Claim Rejections - 35 USC § 112

16. Claim 32 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This rejection has been necessitated due to the claim amendment filed in the paper of 7/22/2008.

Claim 32 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite in its recitation "stringent conditions", which is confusing since it is unclear what level of stringency is encompassed by "stringent conditions". The specification at page 13, lines 5-24 gave examples but did not define "stringent conditions". The temperature and washing conditions encompassed by the recitation "stringent conditions" are not defined. One of skilled in the art would not know what specific conditions are meant by "stringent". The metes and bounds of the claim are indefinite without knowing the exact conditions. One of skilled in the art would not be reasonably apprised of the scope of the invention.

17. Claim 32 remains rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a method for improving plant growth characteristics in a monocotyledonous plant comprising transforming said plant with a nucleic acid encoding an NHX protein of SEQ ID NO: 2 (SEQ ID NO: 1 encodes SEQ ID NO: 2), does not reasonably provide enablement for a method of improving plant growth characteristics in a monocotyledonous plant comprising a nucleotide sequence capable of hybridizing to SEQ ID NO: 1 under stringent conditions. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with the claim for the reasons of record stated in the Office action mailed on 01/24/2008.

Claim 32 is directed to a nucleic acid sequence that would hybridize under stringent conditions of hybridization to the nucleotide sequence of SEQ ID NO: 1. The specification at page 13, lines 5-24 gave examples but did not define "stringent conditions". The temperature and washing conditions encompassed by the recitation "stringent conditions" are not defined. One of skilled in the art would not know what specific conditions are meant by "stringent".

See 112, 2nd paragraph rejection above. The term "stringent conditions" would encompass low or medium levels of hybridization conditions. Thus sequences which are unrelated in function to SEQ ID NO: 1 would also be capable of hybridizing to SEQ ID NO: 1 under said "stringent conditions" of hybridization.

This would encompass hybridization of nucleic acid sequences encoding a protein unrelated in function to instant SEQ ID NO: 2. This would also encompass hybridization of nucleic acid sequences that do not encode a protein.

It may be emphasized that it was very well established in the art (Maniatis et al., Molecular Cloning: A Laboratory Manual, Cold Spring Harbor Laboratory (1982), see in particular, pages 387-389) at the time the claimed invention was made that in order to prevent hybridization of unrelated nucleic acid sequence(s) to a target sequence, hybridization and subsequent washing conditions must be highly stringent. For example, hybridization under conditions of 0.1-1.0x SSC, 50% formamide and 50 ^{o}C for 24 hours, followed by 2 washes in 0.1% SDS, 0.1x SSC at 65 ^{o}C for 25-30 minutes each is considered highly stringent condition that would not allow hybridization of unrelated nucleic acid sequences to the target sequence.

Thus nucleic acid sequences that are unrelated in function to instant SEQ ID NO: 1 would be capable of hybridizing to SEQ ID NO: 1 under stringent conditions of hybridization as instantly claimed.

In the absence of adequate guidance, it is maintained that undue experimentation would have been required by a skilled artisan at the time the claimed invention was made to

determine how to practice the claimed method of improving growth characteristics in a monocotyledonous plant for its full scope, comprising a nucleic acid sequence that is capable of hybridizing to SEQ ID NO: 1 under said stringent conditions.

See Genentech, Inc. v. Novo Nordisk, A/S, USPQ2d 1001, 1005 (Fed. Cir. 1997), which teaches that "the specification, not the knowledge of one skilled in the art" must supply the enabling aspects of the invention.

As the specification does not describe the transformation of a monocotyledonous plant with a nucleic acid sequence that hybridize to SEQ ID NO: 1 under the stringent conditions, undue trial and error experimentation would be required to screen through the myriad of nucleic acids encompassed by the claims and plants transformed therewith, to identify those with improved plant growth characteristic under non-salt stress conditions, if such plants are even obtainable.

It is therefore, maintained that given the claim breadth, unpredictability in the art, undue experimentation, and lack of guidance in the specification as discussed above, the instant invention is not enabled throughout the full scope of the claim.

It is noted that Applicant's responses filed in the papers of 7/22/2008 and 1/27/2009 did not present arguments to traverse this rejection. It is therefore, concluded that the Applicant agrees with the rejection.

18. Claim 32 remains rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the

relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention for the reasons of record stated in the Office action mailed on 01/24/2008.

The essential feature of the claim 32 is a sequence which is capable of hybridizing to SEQ ID NO: 1 under stringent conditions. The specification at page 13, lines 5-24 gave examples but did not define "stringent conditions". The temperature and washing conditions encompassed by the recitation "stringent conditions" are not defined. One of skilled in the art would not know what specific conditions are meant by "stringent". See 112, 2nd paragraph rejection above. The term "stringent conditions" would encompass low or medium levels of hybridization conditions. Thus sequences which are unrelated in function to SEQ ID NO: 1 would also be capable of hybridizing to SEQ ID NO: 1 under said "stringent conditions" of hybridization.

The specification does not describe the structure of nucleic acid sequences that would hybridize to SEQ ID NO: 1 under stringent conditions (see page 13 of specification). This would encompass hybridization of unrelated nucleic acid sequences to SEQ ID NO: 1. The specification does not describe the function of improving growth characteristics (yield and/or modified plant architecture) for said hybridizing nucleic acid sequences when expressed in a monocotyledonous plant, and the plant is grown under non-salt stress conditions.

There is no description of the structure required for the recited function, and no description of the necessary and sufficient elements of a nucleic acid sequence of SEQ ID NO: 1.

One of skill in the art would not recognize that Applicant was in possession of the necessary common attributes or features of the genus in view of the disclosed species.

Since the disclosure fails to describe the common attributes that identify members of the genus, and because the genus is highly variant, SEQ ID NO: 1 and its encoded protein (SEQ ID NO: 2) are insufficient to describe the claimed genus.

Accordingly, it is maintained that there is lack of adequate description to inform a skilled artisan that applicant was in possession of the claimed invention at the time of filing. See Written Description guidelines published in Federal Register/Vol.66, No. 4/Friday, January 5, 2001/Notices; p. 1099-1111.

It is therefore, maintained that given the claim breadth and lack of guidance as discussed above, the specification does not provide written description of the genus broadly claimed. Accordingly, one skilled in the art would not have recognized Applicants to have been in possession of the claimed invention at the time of filing.

Also see in re Curtis (69 USPQ2d 1274 (Fed. Cir.2004), where the court held that there was sufficient evidence to indicate that one of ordinary skill in the art could not predict the operability of other species other that the single one disclosed in the specification. The court held that a disclosure naming a single species can support a claim to a genus that includes that species if a person of ordinary skill in the art, reading the initial disclosure, would “instantly recall” additional species of the genus already “stored” in the minds, but if other members of the genus would not “naturally occur” to a person of ordinary skill upon reading the disclosure, then unpredictability in performance of species other than specifically enumerated defeats claims to the genus.

For at least these reasons and the reasons of record stated in the previous Office Action, the requirement for written description has not been met.

It is noted that Applicant's responses filed in the papers of 7/22/2008 and 1/27/2009 did not present arguments to traverse this rejection. It is therefore, concluded that the Applicant agrees with the rejection.

Claim Rejections - 35 USC § 103

19. Claim 28 remains and claims 22, 25, 30-33 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda et al. (European Patent Publication No. EP 1143002, A1, Published October 10, 2001, Applicant's IDS), and further in view of Wu et al. (Plant cell Physiol. 39:885-889, 1998) for the reasons of record stated for claims 26-27 (now cancelled) and 28 in the Office action mailed 1/24/2008. Inclusion of claims 22, 25 and 30-33 in this rejection is necessitated by the amendment filed in the paper of 7/22/2008. Claim 52 is newly added claim filed in the paper of 7/22/2008.

Applicant traverses the rejection in the paper filed 7/22/2008.

Applicant argues that Fukuda et al. and Wu et al. cannot alone or together teach the claimed invention. Applicant while admitting that NHX protein of SEQ ID NO: 2 is associated with salt tolerance, however argues that even with the benefit of hindsight, plants themselves would only benefit from increased stress resistance, even as to salt, if NHX (SEQ ID NO: 2) was expressed in plant's active growth phase, not during a later stage such as seed maturation. Applicant further argues that Wu et al. do not discuss using seed-specific promoters for any purpose other than to improve seeds and thus one skilled in the art

together with teachings of Wu et al. would not be led to try to improve any plant part other than seeds (response, paragraph bridging pages 12 and 13).

Applicant's arguments are carefully considered but are deemed to be unpersuasive.

It is maintained that Fukuda et al. teach a method of making a transgenic rice (monocotyledonous) plant comprising transforming a rice plant with a nucleic acid sequence encoding the OsNHX1 protein of SEQ ID NO: 2, which has 100% sequence identity to instant SEQ ID NO: 2. The nucleic acid sequence (SEQ ID NO: 1) taught in the reference has also 100% sequence identity to instant SEQ ID NO: 1. The reference also teaches that the nucleic sequence used in making said transgenic plant is from rice, which is a monocotyledonous plant belonging to family Poaceae. The reference also teaches that the transformation comprises introducing and over-expressing the nucleic acid sequence encoding the OsNHX1 protein. The reference also teaches that the overexpression of the nucleic acid sequence resulted in the increased expression of OsNHX1 protein in said rice plant. See in particular, pages 7-8, example 1, paragraphs 0042-0044; pages 8-9, example 2-3, paragraphs 0046-0049; pages 21-22, claims 1-14, and 16; figures 1-3; SEQ ID NOs: 1 and 2. Fukuda et al. also teach that the nucleic acid sequence encoding the NHX (OsNHX1) protein was in sense orientation and operably linked to a CaMV 35S promoter. See page 9, paragraph 0049, line 4. Fukuda et al. also teach that rice is a monocotyledonous crop that has very low tolerance to salt, and is considered a salt sensitive plant species. See page 3, line 34.

It is further maintained that Wu et al. teach rice seed-specific promoter(s) that are active in transgenic seed-tissues. Wu et al. also teach an endosperm-specific prolamin

promoter. See in particular, page 885, abstract; page 886, figure 1, table 1; page 887, figure 2.

It is maintained that it would have been prima facie obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the method of making a transgenic monocotyledonous plant (rice) as taught by Fukuda et al., to substitute the CaMV 35S promoter with a seed-specific or endosperm specific promoter of Wu et al., to obtain a transgenic rice plant and transgenic rice seeds derived thereof, expressing Fukuda et al. OsNHX1 protein from Wu et al. promoter.

It is further maintained that it would have been obvious and within the scope of an ordinary skill in the art to use any seed-specific promoter including the prolamin seed-specific promoter of Wu et al. in over-expressing Fukuda et al. OsNHX1 protein specifically in seed tissues with a reasonable expectation of success.

It is further maintained that given Fukuda et al. teach that rice is a naturally occurring salt-sensitive plant species, one of ordinary skill in the art would have been motivated to specifically overexpress Fukuda et al. OsNHX1 protein in the seeds so that the transgenic rice seeds thrive during seed maturation and germination when grown under naturally occurring salt concentrations with a reasonable expectation of success. It may be emphasized that a naturally occurring soil in which most of the plant species grow normally would be considered a non-salt stress condition.

Thus, while one of ordinary skill in the art would have expressed Fukuda et al. OsNHX1 protein in a plant for the purpose of obtaining an abiotic (salt) stress tolerant

transgenic plant (e.g. rice in the instant case) and/or seeds derived therefrom as discussed above, it would have been obvious that said transgenic plant would have also exhibited any other characteristics including increased seed yield (e.g. increased seed number and seed weight) with a reasonable expectation of success because said increased yield would have been due to Fukuda et al. OsNHX1 protein (100% identity to instant SEQ ID NO: 2) over-expression in the transgenic plant seed.

It is important to note that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, one of ordinary skill in the art would have arrived at the claimed invention with a reasonable expectation of success by combining the teachings of Fukuda et al. and Wu et al. as discussed above.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In the instant case, while one of ordinary skill in the art would have expressed Fukuda et al. OsNHX1 protein in a rice plant for the purpose of obtaining an abiotic (salt) stress tolerant transgenic rice seeds and seedlings derived thereof

as discussed above, it would have been obvious that said transgenic plant would have also exhibited any other characteristics including increased seed yield because said characteristics would be due to the over-expression of Fukuda et al. OsNHX1 protein in said transgenic plant seed. Thus, Applicant is not on point in suggesting that examiner's obviousness is based upon improper hindsight reasoning.

It is therefore, maintained that the claimed invention as a whole is prima facie obvious over the combined teachings of the prior art.

20. Claim 29 remains rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda et al. (European Patent Publication No. EP 1143002, A1, Published October 10, 2001, Applicant's IDS), and in view of Chan et al. (Plant Molecular Biology, 22: 491-506, 1993). Applicant traverses the rejection in the paper filed 9/22/2008.

Applicant argues that Fukuda et al. cannot combine with Chan et al. to teach the claimed invention. Applicant further argues that Chan et al. do not teach that nos promoter is a weak constitutive promoter. Applicant further argues that based on NPTII activity presented in Chan et al., one of ordinary skill in the art would not have concluded that nos promoter is a weak constitutive promoter. Applicant while admitting that it would have been obvious to combine a promoter of Chan et al. with the gene of Fukuda et al. to increase salt stress resistance, however, argues that that one skilled in the art would not be directed to the surprising improvement of the claimed invention whereby the NHX gene can improve yield/biomass or plant architecture regardless of salt stress (response, page 13, lines 5-30).

Applicant's arguments are carefully considered but are deemed to be unpersuasive.

It is maintained that Fukuda et al. teach a method of making a transgenic rice (monocotyledonous) plant comprising transforming a rice plant with a nucleic acid sequence

encoding a OsNHX1 protein of SEQ ID NO: 2, which has 100% sequence identity to instant SEQ ID NO: 2. The nucleic acid sequence (SEQ ID NO: 1) taught in the reference has also 100% sequence identity to instant SEQ ID NO: 1. The reference also teaches that the nucleic sequence used in making said transgenic plant is from rice, which is a monocotyledonous plant belonging to family Poaceae. The reference also teaches that the transformation comprises introducing and over-expressing the nucleic acid sequence encoding the OsNHX1 protein. The reference also teaches that the overexpression of the nucleic acid sequence resulted in the increased expression of OsNHX1 protein in said rice plant. See in particular, pages 7-8, example 1, paragraphs 0042-0044; pages 8-9, example 2-3, paragraphs 0046-0049; pages 21-22, claims 1-14, and 16; figures 1-3; SEQ ID NOs: 1 and 2. Fukuda et al. also teach that the nucleic acid sequence encoding the NHX (OsNHX1) protein was in sense orientation and operably linked to a CaMV 35S promoter. See page 9, paragraph 0049, line 4. Fukuda et al. also teach that rice is a monocotyledonous crop that has very low tolerance to salt, and is considered a salt sensitive plant species. See page 3, line 34.

It is maintained that Chan et al. teach a method of making a transgenic rice (monocotyledonous plant) comprising constitutive expression of nptII coding sequence under the operable control of a weak promoter, such as, a nos promoter from *Agrobacterium*. Chan et al. also teach that the nos promoter exhibits uniform promoter activity in all tissues of a monocoyledonous plant (rice). See in particular, page 491, abstract; page 493, figure 1, materials and methods; page 494, paragraph bridging right and left columns; page 496.

In response to Applicant's argument regarding the strength of nos promoter, Applicant's attention is also drawn to page 17 (lines 1-5) of the instant specification, wherein Applicant states:

> "Also preferred is the use of a weak constitutive promoter, such as Pnos (the promoter of the nopaline synthase *(nos)* gene *from A. tumefaciens),* which is a wall-characterized and widely used weak constitutive promoter with expression around 10 lower than detected for the p35S, in plants."

This implies that at the time invention was claimed it was well known in the art (as admitted by the Applicant in the specification) that nos promoter is a weak constitutive promoter in plants.

It is further maintained that at the time the invention was made, it would have been prima facie obvious to one of ordinary skill in the art to modify the method of making a transgenic monocotyledonous plant (rice) as taught by Fukuda et al., to substitute the CaMV 35S promoter with any other constitutive promoter, including the nos promoter of Chan et al. to arrive at the instantly claimed invention with reasonable expectation of success.

Given that nos promoter exhibits uniform promoter activity in all tissues of a plant as asserted by Chan et al., one of the ordinary skill in the art would have been motivated to express Fukuda et al. NHX protein from Chan et al. promoter, for the purpose of obtaining a uniform (non-chimeric) plant phenotype (e.g. improved growth characteristics etc.) by uniform expression of Fukuda et al. NHX protein in all tissues of the transgenic plant.

It is therefore, maintained that the claimed invention as a whole is prima facie obvious over the combined teachings of the prior art.

21. Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda et al. (European Patent Publication No. EP 1143002, A1, Published October 10, 2001, Applicant's

IDS), and in view of Christensen et al. (Transgenic Research 5, 213-218, 1996). This rejection has been necessitated due to the claim amendment filed in the paper of 7/22/2008.

Fukuda et al. teach a method of making a transgenic rice (monocotyledonous) plant comprising transforming a rice plant with a nucleic acid sequence encoding a OsNHX1 protein of SEQ ID NO: 2, which has 100% sequence identity to instant SEQ ID NO: 2. The nucleic acid sequence (SEQ ID NO: 1) taught in the reference has also 100% sequence identity to instant SEQ ID NO: 1. The reference also teaches that the nucleic sequence used in making said transgenic plant is from rice, which is a monocotyledonous plant belonging to family Poaceae. The reference also teaches that the transformation comprises introducing and over-expressing the nucleic acid sequence encoding the OsNHX1 protein. The reference also teaches that the overexpression of the nucleic acid sequence resulted in the increased expression of OsNHX1 protein in said rice plant. See in particular, pages 7-8, example 1, paragraphs 0042-0044; pages 8-9, example 2-3, paragraphs 0046-0049; pages 21-22, claims 1-14, and 16; figures 1-3; SEQ ID NOs: 1 and 2. Fukuda et al. also teach that the nucleic acid sequence encoding the NHX (OsNHX1) protein was in sense orientation and operably linked to a CaMV 35S promoter. See page 9, paragraph 0049, line 4. Fukuda et al. also teach that rice is a monocotyledonous crop that has very low tolerance to salt, and is considered a salt sensitive plant species. See page 3, line 34.

Fukuda et al. do not teach a maize ubiquitin promoter minus first intron.

Christensen et al. teach that maize ubiquitin promoter without its first intron exhibits uniform and weak consitutive expression compared to the maize ubiquitin promoter having first intron. See in particular, page 213, abstract, introduction; page 217.

At the time the invention was made, it would have been prima facie obvious to one of ordinary skill in the art to modify the method of making a transgenic monocotyledonous plant (rice) as taught by Fukuda et al., to substitute the CaMV 35S promoter with any other constitutive promoter, including a intronless maize ubiquitin promoter of Christensen et al. to arrive at the instantly claimed invention with a reasonable expectation of success.

Given that maize ubiquitin promoter exhibits uniform promoter activity in all tissues of a plant as asserted by Christensen et al., one of the ordinary skill in the art would have been motivated to express Fukuda et al. NHX protein from the intronless maize ubiquitin promoter, for the purpose of obtaining a uniform (non-chimeric) plant phenotype (e.g. improved growth characteristics etc.) by uniform expression of Fukuda et al. NHX protein in all tissues of the transgenic plant.

Applicant's attention is also drawn to page 17, lines 14-18 of the specification, wherein Applicant admits that it was well known in the art at the time the invention was made that maize ubiquitin promoter minus first intron is a weak consititutive promoter.

Thus, the claimed invention as a whole is prima facie obvious over the combined teachings of the prior art.

Conclusions

22. Claims 22, 25, and 28-33 remain, and claims 52-53 are rejected.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vinod Kumar whose telephone number is (571) 272-4445. The examiner can normally be reached on 8.30 a.m. to 5.00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached on (571) 272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Vinod Kumar/
Examiner, Art Unit 1638